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ABSTRACT

This interdisciplinary unit is intended for use with third grade classes. It examines the history and economics of man's relationships to the beaver. It investigates the natural history of the beaver, its anatomy, range, food sources, and the skills it employs to modify its environment by building dams. The structure of beaver dams is examined. Lessons are provided to incorporate concepts of various disciplines of study and can be used in various subject curricula. (RE)

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ED164348

Northern New England Marine Education Project

College of Education

University of Maine at Orono

Orono, Maine

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THE BEAVER

A Marine Education Infusion Unit

A Maine - New Hampshire Sea Grant Project

Supported in Part by NOAA, Office of Sea Grant

U. S. Department of Commerce and by

The College of Education, University of Maine

SE 026 337

THE BEAVER

A Learning Experience for

Marine Education

Northern New England Marine Education Project

Project Staff:

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College of Education, University of Maine
Orono, Maine

Acknowledgements

This unit was prepared and trial tested in schools in Maine and New Hampshire during spring 1978. Each of the units in this Marine Education Program were trial tested in a minimum of five classrooms and were revised as a result of suggestions by the cooperating teachers. Parts of these units and much of our working philosophy was derived from project C.O.A.S.T. developed at the University of Delaware and we gratefully acknowledge the leadership of Dr. Robert Stegner, director of project C.O.A.S.T. These materials were trial tested under the supervision of former assistant director Dr. Les Picker and were written by graduate students in education at the University of Maine (Orono) and cooperating teachers in the schools of Union, Maine; Freeport, Maine; and Hampton, New Hampshire. We call these units - trial units - because we hope you will try them in your classroom and modify them to suit your situation.

John W. Butzow
Project Director
January 1979

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NORTHERN NEW ENGLAND MARINE EDUCATION PROJECT

ANNOTATED LIST OF INFUSION UNITS: K-8

Trial Edition A

K Clams and Other Critters: a unit on shells (living and non-living). Includes crafts, science, language arts, home economics, math and other areas (Butzow and Jones)

K + 1 Marine Art: art and craft activities to be used in many subject areas (Picker)

2 The Aquarium: revolves around a freshwater aquarium setup. Language arts, math, science, art and others. (Kilfoyle)

3 The Beaver: study of the history, economics and natural history of the beaver. Social studies, language arts, music, arts, crafts, science, math. (DiSilvestro)

4 The Lobster: explores the economics, history, biology, literature of the lobster. Home economics, art, crafts, science, social studies, literature. (Kilfoyle)

5 Whales and Whaling: a complete study of the history, biology and economics of whales and whaling. Language arts, music, math, science, social studies, arts, crafts, industrial arts. (Picker, Carkin)

6 Our Heritage of Ships: surveys the development of ships, with emphasis on New England. Science, art, music, crafts, literature, language arts, social studies. (Glueck, Butzow)

7 Ships, Shipping and Waterways: explores ships and seaways today, with emphasis on New England. Social studies with excursions into science, arts. (glueck, Butzow)

8 Coastal Indians of Northern New England: three part approach to Indian studies, culminating in an "Indian Day or Evening." Independent study suggested for Part II. Language arts, library science, music, art, crafts, social studies, marine science, industrial arts. (Picker, DiSilvestro)

Units are available from:
Northern New England Marine Education Project
Shibles Hall, College of Education
University of Maine at Orono
Orono, Maine 04469

Some teachers' and youth leaders' comment on The Beaver

"The children drew their own beaver site and told a short story about it. They worked hard and seem to be sorry the beaver unit is finished."

"I had no real problems with the unit. I felt it was very well laid out and it created a great deal of enthusiasm with the children. They really enjoyed the unit's activities and especially liked the slides and making the dioramas. The unit itself for the teacher was easy to follow and there was plenty of background material for the teacher. Overall, an excellent experience for both teacher and children."

"I feel this is an excellent unit, well put together and with high interest value."

"Excellent project--I used shoe boxes. They are very proud of their beaver sites and I'm proud of them. Each one made their own using their own ideas.

It took 3 afternoons to complete as they used paint for backgrounds--then put in the trees, stumps, dam, lodge, beavers (brown clay) etc."

"The children enjoyed many art projects beside the diorama. They made x-ray views of beaver lodges, a mural, clay figures and stuffed toy beavers made of wool with leather tails. We developed a large chart of beaver adaptations--listing special beaver features and the function of each."

"I would recommend previewing the slides before showing them to your class so that you understand what each slide is about. They are beautiful slides and show excellent concepts."

"The Hunting of Pau Puk Keewis is such a catchy tune that the children wanted it played over and over. We played it while they were working on their dioramas and all were singing along. (A delightful sight and sound!)"

TITLE: THE BEAVER

*MARINE CONCEPT: 3.21

3. Marine organisms interact in complex ecosystems.

3.2 Marine organisms are adapted to their environments in different ways

3.21 Marine organisms are adapted developmentally, structurally, functionally, and behaviorally to their ways of life.

GRADE LEVEL: 3 (adaptable to 2-4)

SUBJECTS: Science, Language Arts, Art and Music, Math

CLASS PERIODS: 5-15

AUTHOR: Victor DiSilvestro

CONTRIBUTORS: Richard Bednar, Mildred Burns, Judith Daniels, Johanna Dickinson, Janet Duforer, Evelyn Potter, Carla Rensenbrink, and Nancy Sylvester

ACKNOWLEDGEMENTS: Jess Fuller for the music and singing performance for The Hunting of Pau Puk Keewis by Longfellow
Betty Roker for her initial illustrations
Rita Newell for the final illustrations
Steve Green for the photographic work

EDITED BY: Les Picker

*From Marine Environment Proposed Conceptual Scheme, Robert W. Stegner, 310 Willard Hall, University of Delaware, Newark, DE 19711

Please send evaluations of learning experiences to:

Northern New England Marine Education Project
College of Education
University of Maine at Orono
Orono, Maine 04469

INSTRUCTIONAL OBJECTIVES

At the conclusion of this unit, the student will be able to:

1. Describe a beaver, its work and its habitat.
2. Explain that because of structural adaptions of the ears, teeth, nose, feet, tail, and body covering, the beaver is well suited for life in and near the water.
3. Explain how a beaver through its dam building activities changes the habitat of an area.
4. Describe the structure of the beaver's lodge and burrow, and how the lodge is built.
5. Describe how a dam is built.
6. Construct a model of a beaver dam and/or pond.
7. Explain that beaver food habits are related to its wetland habitat.
8. Write a short story about some aspect of the beaver.
9. Develop a large mural depicting the life habitat of the beaver, using the field trip as background.
10. Present orally or artisticly something that he/she saw on the field trip.
11. List evidence of beaver populations existing in an area.

SLIDE DESCRIPTIONS

1. This introduction slide is of the painting by John J. Audubon from his collection of works on American mammals. The paragraph is informative.

2. An early American trapper.

3. The present range of the beaver.

4. A beaver, note the wide flat tail and two tone fur.

5. View of a beaver in its natural habitat. Note the water plants the beaver is eating.

6. A stump, and a half gnawed through tree. This is a good indication that beavers are around. Note how this tree looks different from one cut down by an ax.

7. Another tree gnawed by a beaver. Note wood chips and sawdust at the base of the tree.

8. Group of tree stumps. Note cleared out area right down to the water, and the beaver lodge across the pond.

9. A beaver dam. The woman gives you a good idea how high the dam is (2.5 meters, 7 feet). Note grass growing on the dam. This helps hold the dam together and decrease leaking.

10. Close up of wall of dam. Note grass on the dam and how the sticks are laid mostly vertically.

11. Top of the dam. Note how the sticks and logs all face in one direction and that the logs are debarked. The beavers eat the bark.

12. Close up of top of dam. Note the gnawed log, which is debarked.

13. Aerial view of a beaver pond. Note the dam on the right, position of the lodge, fallen trees in the background and the beaver road just to the right of the lodge.

14. Close up of lodge from slide #13. It's about 2 meters high.

15. Cross section of beaver lodge.

16. Aerial view of another beaver pond. Note stream leaving pond in upper right, and how lodge is in the center of the pond instead of on the side as in slide #13.

17. Newly built beaver lodge. Fresh mud is an indication of building activity.

18. Beaver pond, note lodge, dam on the right, and beaver road to the right of the lodge going up the hill.

19. A beaver canal. This canal formed when the beaver road filled with water. It is about 10 cm deep. Note road continuing past it.

20. Beaver road going towards the pond. Note how heavily it is worn down.

21. Another beaver road; these roads provide paths for other animals as well as the beaver.

22. The trees from those tree stumps were probably carried down that road.

23. The branches in the water in front of the lodge are the beavers' food supply for the winter. They sink to the bottom as they become water logged.

24. Close up of slide #23. Note the bark still on the branches which will be eaten later in the winter, and the dark water logged branches.

25. The beaver's webbed feet, large teeth, and large flat tail.

26. A hind webbed foot, front paw, and the nail on the right is used to clean and oil the fur.

27. Skull front view, note large dark teeth.

28. Skull side view, the space between the front and back teeth allows the wood chips to fall out of the mouth during chewing.

29. The power of the beaver's teeth is shown and its ability to use the materials of its environment.

30. A beaver trap. The light cross in the center triggers the trap.

31. A park ranger. This emphasizes the role women can play in today's America.

TEACHER BACKGROUND

History

The history of America was greatly affected by the desire for beaver fur in colonial America and Europe. Before white people came to America, the beaver was primarily hunted by the Indians of the northern forest for food (the beaver was roasted in its fur), for tools (beaver's teeth were used as scrapers), and for clothing (the beaver's fur was used as hats, gloves, etc.). When the white people came to America, they found the beaver in such great numbers and so easily attainable, that they saw the beaver as a great resource to exploit. Though the Indians practiced conservation of the beaver, such as only trapping males or only trapping from a pond for one season, the white people did not and the beaver populations were soon decimated. Many of the early American explorers were looking for new populations of beavers. Though the beaver once covered much of North America, its range has been somewhat restricted. It is now being reintroduced to many areas. (See slide 1-3)

Recognition

One of the largest rodents in America, it is 92-108 cm (34-40 inches) long from nose to tip of tail. It weighs from 14-30 kg (30-66 lbs). The beaver has a long flat tail which it uses in dam construction and locomotion. The fur is a dark color with a lighter color underneath. You will know a beaver is around by first observing a dam, fresh gnawed wood chips around tree stumps, canals, and then a lodge, which the beaver may or may not build. (See slides 4-8)

Beaver Constructions

1. Dam: The reason the beaver builds a dam is two-fold: first, to provide itself with an area of relative safety and second, to provide an easy way to move food and building materials. Dams are usually worked on and repaired in the spring and built in the fall. The dam is built by placing the cut logs lengthwise into the bottom of the stream. The logs are placed facing upstream. The beaver then places mud and stones onto the logs and this continues until the dam is at the desired height. The dam is built high enough so the water will get deep enough not to freeze solid in the winter. Dams over 200 m long (600 ft) and 2.5 m high (8 ft) have been found. (See slides 9-12)

2. Lodge: The beaver builds two types of lodges: the bank barrows and the more familiar stick house. The barrows are found more frequently in areas of high human populations. It is simply a dug out bank of a pond or stream with an under-water entrance and a ventilation hole on top. The stick lodge found in the middle of a beaver dammed pond is made by piling sticks and mud together. The beaver then digs down into the mud and up under the mound of sticks and mud and chews out the center of the mound. The lodge affords the beaver protection from the weather and predators, and a place to leisurely eat. (See slides 13-17)

3. Canal: The canal is dug by the beaver to extend the safety of its pond to its food supply. Canals over 200 m long (600 ft) and 65 cm deep (2 ft) have been found. (See slides 18-19)

4. Road: The beaver road is a cleared path made by the beaver so it is easier for it to drag logs out of the wooded area to the pond. Sometimes these roads fill with water and are then canals. (See slides 20-22)

Food

The beaver eats the bark of poplars, aspens, birches, and willows. The beaver cuts down these trees and eats the young bark at the top of the tree. The rest of the tree is eaten by deer and porcupines. Beavers also like to eat berries, marsh grasses, and the roots of various pond plants such as arrowhead and cattails. (See slides 23-24)

Behavior

Most beavers mate for life and share in the building of their dam and lodge. The female beaver usually matures at 2-3 years of age. Three months after mating, 2-4 kits are born, usually in April-July. The kits stay with the parents for two years then they are kicked out of the lodge to find their own stream in the sun. So a winter lodge should contain 2 adults, 2-4 yearlings, and 2-4 kits. The kicking out of the yearlings by the adults assures the dispersal and non-overcrowding of the beavers. The average life span of a beaver is 16 years.

Adaptations

The beaver comes equipped for life in the water. Its ears and nose are valved so water cannot get in. A beaver cannot breathe through its mouth so it can eat underwater. Its feet are webbed for swimming,

in fact, a beaver can swim .3 km ($\frac{1}{2}$ mile) underwater. The beaver's flat tail also aids in swimming. The beaver's teeth, as in all rodents, is built for gnawing. The beaver's teeth grow forever so it must gnaw to wear them down. (See slides 25-29)

Economics

Trapping, though in limited amounts, still is practiced throughout North America. It is mostly a hobby and not done for a living. There are about 4,000 registered trappers in Maine and many more in New Hampshire. Wildlife wardens protect the beaver during the off season. This would be a fine job for any man or woman who loves the outdoors and wildlife. (See slides 30-31)

Leader Preparation

1. Give pretest; duplicate or write questions on the board.
2. Obtain a large roll of newsprint paper for mural.
3. Select field trip location and make arrangements.
4. Obtain field trip equipment: field glasses, tape recorder, notebooks and pencils.
5. If desirable, pre-visit field trip area to get idea of plants and animals to be seen on the field trip. Locate a suitable vantage point to observe the beaver lodge and dam.
6. Obtain from library and other sources any books and pictures that contain information about beavers and other forms of pond life. (See book list)
7. Obtain any films, film loops, or filmstrips about beavers.
8. Obtain tape player to play folksong.
9. Duplicate the words of the folksong, "The Hunting of Pau-Puk-Keewis" by Longfellow, to distribute before the song. (A copy enclosed)
10. Obtain materials for diorama (see diorama instructions) and other art activities.

PRETEST

1. Where would you look for a beaver?

2. What does a beaver look like? (draw or write)

Underline the correct answer.

3. The beaver is able to move fastest by (walking, Swimming, flying).

4. The beaver eats mostly (plants, animals).

Answer Yes or No.

5. The beaver is a furry animal.

6. The beaver gnaws down trees.

7. The beaver builds dams.

How to Present the Unit, A suggested Approach

1. Give Pretest.
2. Explain that all living things which are not plants are animals.* To make sure that the students don't think that only mammals are animals, discuss other animals from invertebrates up to mammals (lead the discussion). Tell the students that they will be learning about the beaver, a mammal. Discuss the characteristics of a mammal and compare these with birds, etc. The characteristics of mammals are: hair, nursing of young, female has mammary glands and warm bloodedness.
3. Give slide presentation, using teacher's background as a guide or flow sheet, if desired. Supplement the teacher's background with your own information. Ask students questions about each topic of the slide presentation.
4. Show movie or filmstrip - discuss.
5. Discuss field trip: clothing, lunch, etc.
6. Introduce the students to all the resources in the classroom about beavers. Allow time for reading before field trip.
7. Take field trip.
8. Follow-up activities.

*Using a dual classification system. We are ignoring the Protist Kingdom for our purposes.

Field Trip (See resource section for help in locating beaver sites)

1. Equipment needed:

   a. cassett recorder--to record observations of students

   b. paper and pencils

   c. field glasses or spotting scope

   d. camera--to visually record field trip

2. Activities: (Stress QUIET)

   a. Photograph entire trip from boarding bus to getting home.

   b. Observe area: record the description of the pond and shore, and the upland area.

   c. Observe and record the plant life (guide the students). See what plants look eaten, and what plants the beaver may eat.

   d. Look for beaver and other animal signs. Let the students decide what is a sign and what isn't (record these).

   e. From viewing vantage point, observe the beaver dam and lodge. This activity can be done first so that you don't scare the beavers away while doing other activities (record).

   f. Have students with paper and pencils draw from sight something that appeals to them on their trip.

   g. During lunch discuss with the students the beaver's eating habits based upon their observations of the visible plants.

3. Time:

   The field trip should be no more than 2 hours long, excluding lunch. If the field trip is held in the winter, the students may do all the observation from inside the bus if a proper pond is located.

Field Trip Follow-Up Activities

1. Play the tape recording of the students observations. Outline the major points on the board such as area description, plants, beaver and other animal signs. Use this outline to guide the development of a mural.

2. The pictures that were taken during the field trip can be put up to tell a story about the trip. Let the students discuss and decide on a name for the picture collection. (e.g. "Our Trip to Beaver Pond")

3. Have students prepare and present orally something they saw on the field trip and why they thought it was important to the life of the beaver.

4. Using a town map, have students label where beaver dams had been or are made in the town. Have the students see who lives the closest and farthest from the beaver dams.

5. Build a diorama (see instructions).

6. Listen to the folksong sung by Jess Fuller, "The Hunting of Pau-Puk Keewis" from the Tales of Hiawatha by Longfellow. You may wish to explain the song beforehand so the children will not confuse the characters. Have each student, using his or her background experience of the field trip, draw his or her interpretation of the song.

7. Have each student write a short story about pau-Puk Keewis. Collect the stories and duplicate each story so each student can have a collection of short stories. Include in the story a description of the beaver, where it lives, and what it eats.

8. Have some students look up facts and other pertinent data concerning beavers and their environment. Encyclopedias, National Geographic and material from Ranger Rick magazine are quite useful.

9. Develop a large wall chart of beaver adaptations listing special beaver features and the function of each.

EVALUATION OF PROGRESS

A comparison of the written story and oral report with the pre-test should give an indication of the increase in knowledge of the subject matter. Contribution to observations and discussions should also be considered.

DIRECTIONS FOR DIORAMA

Materials: non-toxic water color paints: blue, green, brown, yellow, red, etc.

sticks: 5 cm long, 3 to 5 cm wide, to make dam and lodge

piece of wood or plaster of paris to be made 10 cm x 10 cm x 2 cm; to be painted blue to represent pond

glue (Elmers)

masking tape

potting soil, 1 bag should do it

pine cones, inverted and painted green to make trees (certain dried lichens make excellent trees, also)

clay to make beavers, less than 1 kg (2 lbs) needed

piece of wood or plaster of paris or clay to measure $\frac{1}{2}$ cm x 1 cm x 10 cm; to be painted blue to represent stream coming out of dam

two cardboard boxes (25 cm x 30 cm x 25 cm)

Figure 1 will serve as a guide in cutting the cardboard boxes. Let the students paint scenes on the inside of the box before building the dam and lodge. Let the student's imagination dictate the manner in which the diorama is developed. The idea behind the diorama is to have the students construct a scene which reflects the beaver's environment. Include the lodge, a dam, stream, trees, the beavers, etc.

DIORAMA DIRECTIONS

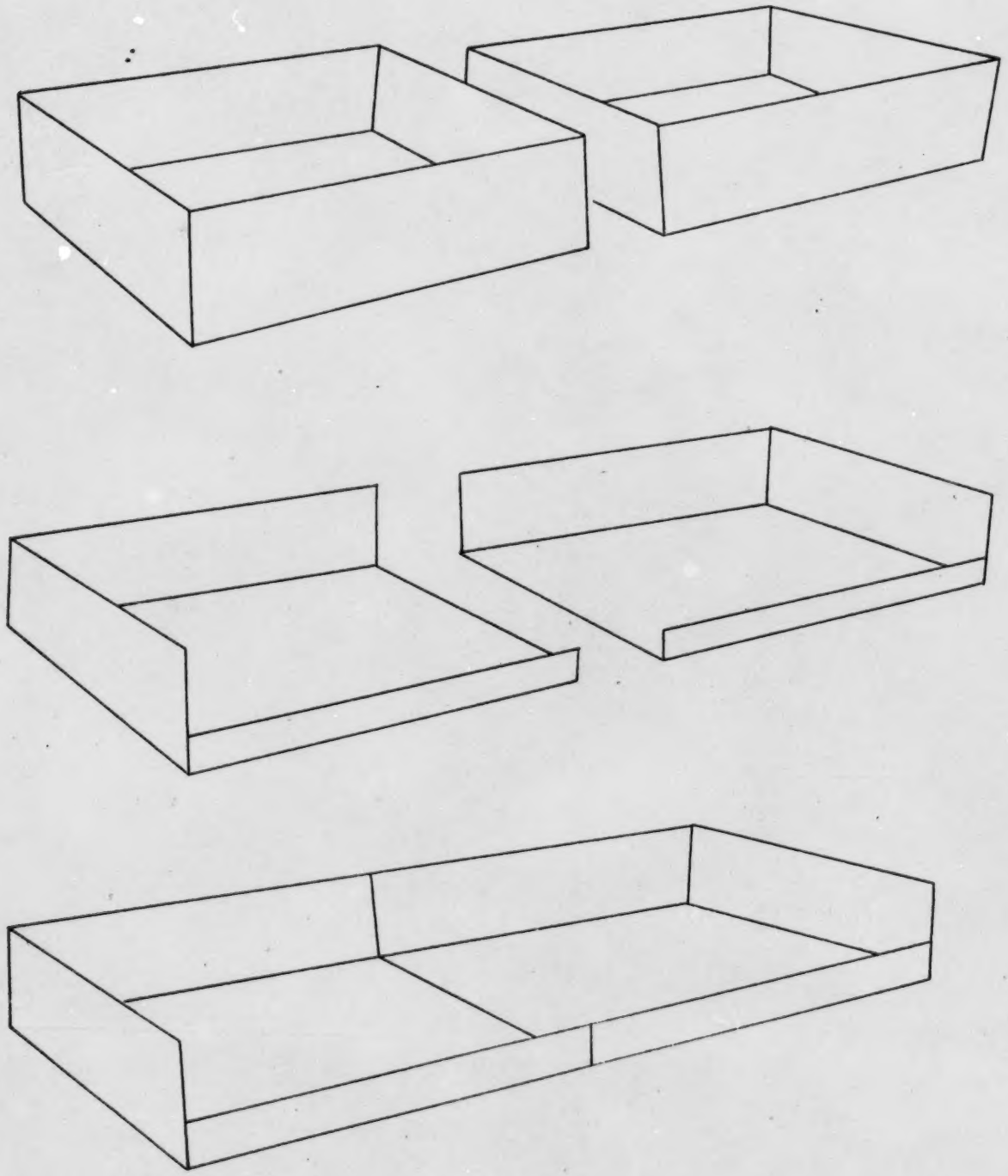


Figure 1

THE HUNTING OF PAU-PUK KEEWIS

Through bush, and brake, and forest
Ran the cunning Pau-Puk Keewis,
Like an antelope he bounded,
Till he came unto a streamlet
In the middle of the forest.

To a streamlet still and tranquil,
That had overflowed its margin,
To a dam made by the beavers
To a pond of quiet water,
Where knee deep the trees were standing,
Where the water lilies floated,
Where the rushes waved and whispered.

On the dam stood Pau-Puk Keewis,
On the dam of trunks and branches
Through whose chinks and water spouted.
O'er whose summit flowed the streamlet.

From the bottom rose the beaver,
Looked with two great eyes of wonder.
Eyes that seemed to ask a question,
At the stranger, Pau-Puk Keewis.

On the dam stood Pau-Puk Keewis,
O'er his ankles flowed the streamlet,
Flowed the bright and silvery water,
And he spake unto the beaver,
With a smile he spake in this wise:
'O my friend Ahmeek, the beaver,
Cool and pleasant is your water;
Let me dive into the water
Let me rest there in your lodges;
Change me, too, into a beaver!'

Cautiously replied the beaver,
With reserve he thus made answer:
'Let me first consult the others.
Let me ask the other beavers.'

Down he sank into the water
Heavily sank he, as a stone sinks,
Down among the leaves and branches,
Brown and matted at the bottom.

On the dam stood Pau-Puk Keewis,
O'er his ankles flowed the streamlet
Spouted through the chinks below him,
Dashed upon the stones beneath him,
Spread serene and calm before him;

And the sunshine and the shadows
Fell in flecks and gleams upon him,
Fell in little shining patches,
Through the waving, rustling branches.

From the bottom rose the beavers,
Silently above the surface
Rose one head and then another,
Till the pond seemed full of beavers,
Full of black and shining faces.

To the beavers Pau-Puk Keewis
Spake entreating, said in this wise:
'Very pleasant is your dwelling,
O my friends! and safe from danger;
Can you not with all your cunning,
All your wisdom and contrivance,
Change me, too, into a beaver?'

'Yes!' replied Ahmeek, the beaver,
He the King of all the beavers,
'Let yourself slide down among us,
Down into the tranquil water.'

Down into the pond among them
Silently sank Pau-Puk Keewis;
Black became his shirt of deerskin,
Black his moccasins and leggins,
In a broad black tail behind him
Spread his fox tails and his fringes;
He was changed into a beaver.

'Make me large,' said Pau-Puk Keewis
'Make me large and make me larger,
Larger than the other beavers.'

'Yes,' the beaver chief responded,
'When our lodge below you enter,
In our wigwam we will make you
Ten times larger than the others.'

Thus into the clear brown water
Silently sank Pau-Puk Keewis;
Found the bottom covered over
With the trunks of trees and branches,
Hoards of food against the winter,
Piles and heaps against the famine;
Found the lodge with arching doorway,
Leading into spacious chambers.

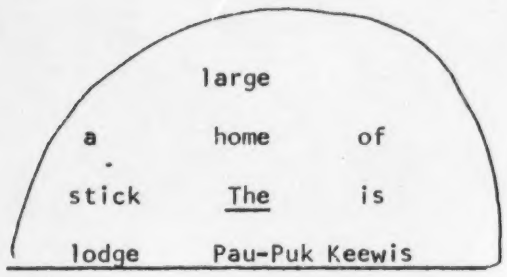
Here they made him large and larger,
Made him largest of the beavers,
Ten times larger than the others.
'You shall be our ruler,' said they;
'Chief and King of all the beavers.'

Language Arts

1. Beaver Tales:

Objective: To practice arranging a complete sentence using correct capitalization and punctuation.

Procedure: Make copies of the "Beaver Tales" and hand them out. The students must unscramble the words in the lodges to form a sentence. The word which is underlined should be the first word of the sentence if the other words are to fall in place. The student must then put the sentences in some order to form a "Beaver Tale." No order is right, as long as a story or paragraph forms. See what your students develop.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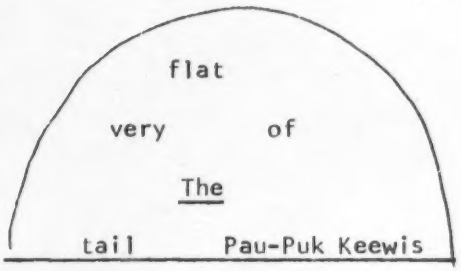
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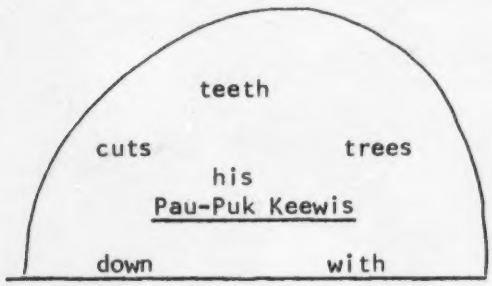
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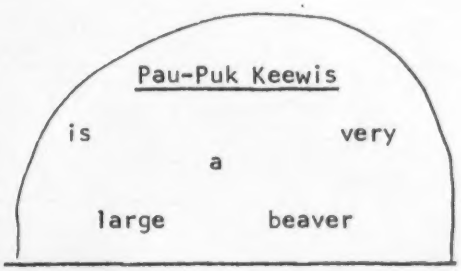
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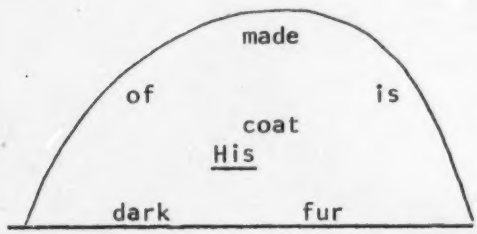
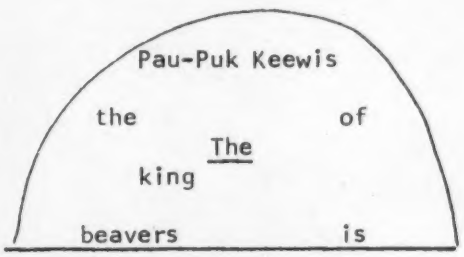

made
of is
coat
His
dark fur


Pau-Puk Keewis
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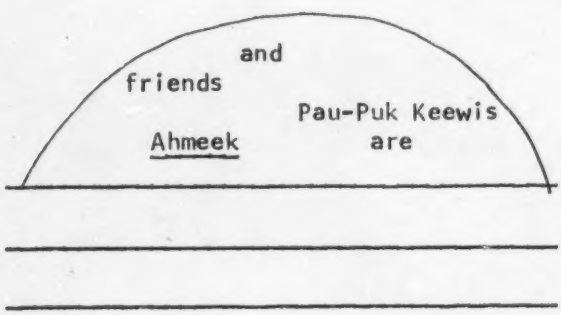
and
friends
Pau-Puk Keewis
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2. Person, Place or Thing - Grammar

Objective: To help the child understand the different forms of a noun.

Materials: Paper and pencil

Procedure: Write the words given below on the board and explain to the class that each word is the name of a person, place, or thing. Ask each student to write the words on a piece of paper and after each word write "person" if the word is the name of a person, "place" if it is the name of a place, and "thing" if it is the name of a thing. This exercise can be done either as a class or individually if the children are capable.

1. pond (place)
2. trapper (person)
3. beaver (thing)
4. plants (thing)
5. student (person)
6. fur (thing)
7. ranger (person)
8. pencil (thing)
9. teacher (person)
10. dam (thing)
11. log (thing)
12. Indian (person)

3. BEAVER DAM

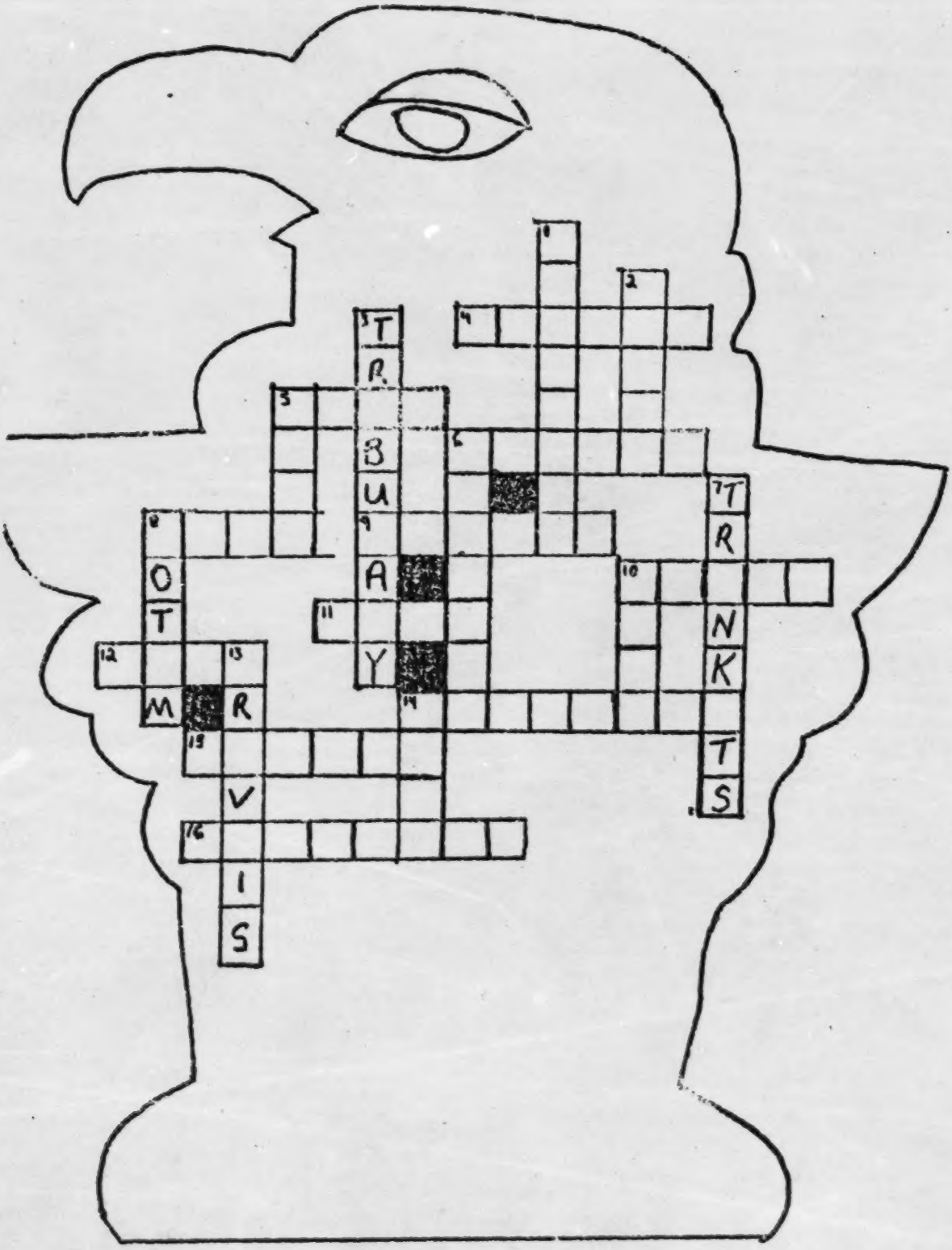
Down

1. An Indian hatchet
2. An Indian tent
3. A stream flowing into a larger one
5. A large, woody plant
6. One who traps animals
7. Small articles used as trade goods
8. A tribal symbol
10. A path or track
13. A device made of poles and pulled by a horse
14. Small branch

Across

4. Wooded land
5. Part of an animal
6. The one to whom the trapper sold his furs
8. Not wild
9. An animal's footprints
10. Group of Indians under one chief
11. A device for catching animals
12. A canvas shelter
14. A succession of baited traps
15. Buffalo fat
16. A long, narrow, flat-bottomed sled

From: Crossword Puzzle Book
Whitman Publishing Company
Racine, Wisconsin 1967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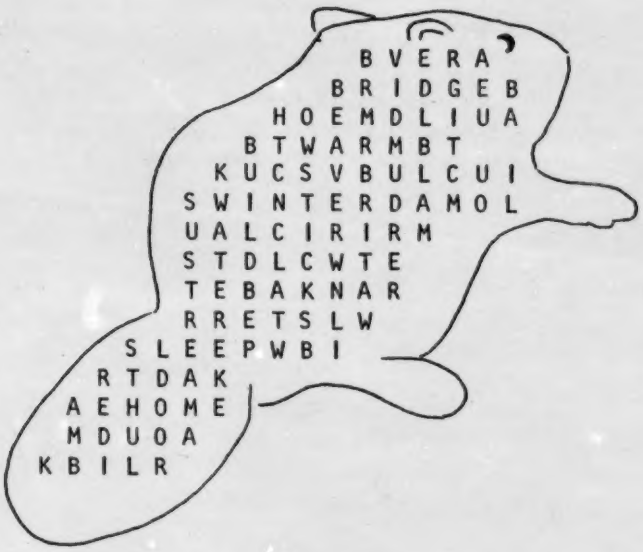
Answers: ACROSS: 4. timber 5. tail 6. trader 8. tame
9. tracks 10. tribe 11. trap 12. tent 14. trapline
15. tallow 16. toboggan
DOWN: 1. tomahawk 2. tepee 3. tributary 5. tree
6. trapper 7. trinket 8. totem 10. trail 13. travois
14. twig


B V E R A
B R I D G E B
H O E M D L I U A
B T W A R M B T
K U C S V B U L C U I
S W I N T E R D A M O L
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S T D L C W T E
T E B A K N A R
R R E T S L W
S L E E P W B I
R T D A K
A E H O M E
M D U O A
K B I L R

4.

BUSY	BEAVER
Beaver	Mud
Bridge	Sleep
Build	Sticks
Dam	Stream
Door	Warm
Home	Water
Winter	

From: Search A-Word Shapes
Dawn Gerger
Tempo Books; Grosset &
Dunlap, N.Y.

5. Write original poems or Haikus about beavers. Discuss the Longfellow poem Hiawatha from which the folksong "The Hunting of Pau Puk Keewis" was taken.
6. Have each student answer the essay question "How would it feel to you to be a beaver?"
7. Develop a vocabulary list containing words which you feel are appropriate to the unit such as:

a. webbed
b. rodent
c. canal
d. castor
e. sapling
f. shedding
g. bank burrow
h. valves
i. mammals
j. adaptations
k. lodge
l. instinct
m. kits
n. trapline

Art

Besides the diorama and the mural you may wish to try these ideas.

1. Try making paper mache beavers. Paste can be made with flour and water. Newspapers can be used as paper material and poster paints can be used to paint the beavers.

2. Have some students make clay figures of beavers.

3. Make stuffed toy beavers made of wool with leather tails.

4. Using construction paper have the students cut out beavers, trees, logs, etc. to paste on manila paper to create a beaver pond scene.

5. Draw X-ray views of beaver lodges.

6. Design and make hand puppets of the characters in the poem The Hunting of Pau-Puk Keewis. Have the students give a puppet show dramatizing the poem.

Math

1. Eight streams ran through Beaver Valley. Now beavers, being as they are, build dams on streams to form ponds in which to build their lodges. If there is one lodge per pond and one pond per stream, how many lodges could be built in Beaver Valley?

2. Beaver boys like beaver girls and beaver girls like beaver boys. After they court and get married they build themselves a dam on a stream and a lodge on the pond. If there are 2 beavers (1 boy and 1 girl) per pond in Beaver Valley, how many beavers are in Beaver Valley?

3. After a couple of years the girl beaver has some baby beavers, called kits. If each girl beaver has 2 kits, how many kits will there be in Beaver Valley? _____ How many beavers all together (counting fathers and mothers and kits)?

4. One day, 6 beavers (3 boys and 3 girls) moved into Beaver Valley from Beaver Mountain because their ponds were full of otters who kept bothering them. How many more streams will be needed in Beaver Valley so that the 6 new beavers can build a dam.

SUGGESTED MOVIE LIST

The following movies are available from the University of Maine Film Library, Orono, Maine 04469

Title	Order #	Cost	Time
The Beaver	S-83	$ 5.25	11 min.
Builders by Nature	M-1319	4.75	22 min.
In Beaver Valley	L-135	11.25	32 min.
World of the Beaver	L-610	13.25	32 min.
How the Beaver Stole Fire	M-1619	9.25	12 min.

In New Hampshire, consult the University of New Hampshire for similar films.

Filmstrips

1. Mr. & Mrs. Beaver and Their Family
   Educational Filmstrip
   Produced & Distributed by Society for Visual Education, Inc.
   Chicago, Illinois 60614

2. Billy Beaver (from Animals of the Friendly Forest Series)
   Curriculum Films, Inc.

3. Lodges (from Animal Home Series)
   Curriculum Films, Inc.

Slides

Slide packet for the unit is available from the Instructional Systems Center, Shibles Hall, UMO, Orono, Maine 04469

Field Trip References

Contact: Local Wardens

Local hunters and trappers

State Department of Fish and Game

Area Extension Agent

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Dugmore, A. Radclyffe. The Romance of the Beaver. William Heinemann, London. 1914.

Elman, Robert. The Living World of Audubon Mammals. Grosset & Dunlap, N.Y. 1976.

Murie, Olaus J. A Field Guide to Animal Tracks, 2nd ed., Houghton Mifflin Co., Boston. 1975.

Palmer, E. Laurence and Fowler, H. Seymour, Fieldbook of Natural History, 2nd ed. McGraw-Hill Book Co., N.Y. 1975.

Seton, Ernest T. Lives of Game Animals, Vol. IV, Part II., Doubleday, Doran & Co., Inc. N.Y. 1929.

Stokes, Donald W. A Guide to Nature in Winter. Little, Brown & Co., Boston. 1976.

SUGGESTED BOOKLIST

(Book order # included)

BEAVERS

Annixter, Jane & Annixter, Paul. Ahmeek. Holiday. 1970. (#ISBN 0-8234-0173-1)

Crosby, Alexander L. Beavers. Garrard. 1960. (#ISBN 0-8116-6150-4)

Goudey, Alice E. Here Come the Beavers. Scribner. 1957. (ISBN 0-684-13146-3)

Hay, Keith. The Beaver's Way. National Wildlife. 1973. (ISBN 0-912186-06-2)

Liers, Emil. Beaver's Story. Viking Pr. 1958. (ISBN 0-670-15357-5)

Lippincott, Joseph W. Chisel-Tooth the Beaver. Lippincott. 1936. (ISBN 0-397-30028-X)

Poling, James. Beavers. Watts. 1975. (ISBN 0-531-00828-2)

Roels, Beaver. G & D. 1969. (ISBN 0-448-03053-5)

Rounds, Glen. The Beaver: How He Works. Holiday. 1976. (ISBN 0-8234-0287-8)

Rounds, Glen. Wild Orphan. Holiday. 1961. (ISBN 0-8234-0147-2)

Rue, Leonard L. World of the Beaver. Lippincott. 1964. (ISBN 0-397-00360-9)

Tresselt, Alvin. Beaver Pond. Lothrop. 1970. (ISBN 0-688-51123-6)

BEAVERS STORIES

Barr, Catherine. Little Ben. Walck. 1960. (ISBN 0-8098-1064-6)

Brady, Irene. Beaver Year. HN. 1976. (ISBN 0-395-24208-8)

Burgess, Thornton W. Adventures of Paddy the Beaver. G & D. (2710)

Charles, Donald. Busy Beaver's Day. Childrens. 1972. (ISBN 0-516-03420-0)

De Bruyn, Monica G. The Beaver Who Wouldn't Die. Follett. 1975. (ISBN 0-695-40586-1)

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Dodd, Ed. Chipper, The Beaver. Putnam. 1968. (ISBN 0-399-60093-0)

Edmonds, Walter D. Beaver Valley. Little. 1971. (ISBN 0-316-21164-8)

Hoban, Russell. Charlie the Tramp. Scholastic Book Service. 1967. (ISBN 0-590-07049-5)

Hurd, Edith T. The Mother Beaver. Little. 1971. (ISBN 0-316-38317-1)

Kjelgaard, Jim. Chip, the Dam Builder. Holiday. 1950. (ISBN 0-8234-0028-X)

Rumsey, Marian. Beaver of Weeping Water. Morrow. 1969. (ISBN 0-688-31074-5)

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Robinson, Carmelita. Life in a Pond. Western Pub. 1967. (ISBN 0-307-63600-3)

Wong, Herbert H. & Vessel, Matthew F. Pond Life: Watching Animals Find Food. 1970. (ISBN 0-201-08732-4)

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Buck, Margaret W. Pets from the Pond. Abington. 1958. (ISBN 0-687-30865-8)

Busch, Phyllis. Puddles & Ponds: Living Things in Watery Places. Collins-World. 1969. (ISBN 0-529-00515-8,A3154W)

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Carrick, Carol. Pond. Macmillan. 1970. (71731)

Clegg, John. Your Book of Freshwater Life. Transatlantic. 1968. (ISBN 0-571-08399-4)

Cooper, Elizabeth K. Science on the Shores & Banks. HarBraceJ. 1966. (ISBN 0-15-679609-0, AVB38, VoyB)

Cooper, Elizabeth K. Science on the Shores & Banks. HarBraceJ. 1960. (ISBN 0-15-270843-X)